General Genetics. M. J. Sirks. Nijhoff, The Hague, 1956. 628 pp. Illus. Gld. 35.

This English edition of Sirks' *General Genetics,* first published in Dutch in 1922, emphasizes the historical aspects of the subject. In this respect it will serve as a useful reference book, especially to the work prior to 1940.

In the hands of Sirks and his translators, Jan Weijer and D. Weijer-Tolmie, however, this approach does not lend itself well to an exposition of the subject. The book appears to have accumulated information through the five Dutch editions and the present English one without critical evaluation or successful integration of the material so brought together.

An example will illustrate. Meiosis is nowhere clearly described. The old argument of pre- and postreduction is treated at some length before any attempt is made to relate it to what is currently known about meiosis and crossing over. In this review of material of purely historical interest, the following statements appear: "Classic contributions to this very important problem have been given by Gregoire (1905, 1910). Unfortunately his studies in this sphere are almost forgotten today." If one is not told what these classic contributions were or why they are important, it is not at all obvious why they are mentioned. Finally, Knapp is cited for the now generally accepted view that postreduction (second division segregation) is a result of crossing over between the locus concerned and the centromere. The earlier work that led to this interpretation (Bridges and Anderson, on *Drosophila* triploids; Anderson and others on attached-X chromosomes; and Lindegren on *Neurospora*) is not mentioned or cited in the bibliography.

The mechanism of crossing over is treated in a confusing way, with no clear statement about the importance of the question of randomness or nonrandomness with which strands participate in crossing over at a given level.

Figure 54 in the book, a graphic representation of the relation of crossing over to temperature in *Drosophila,* taken from Plough, shows a maximum at 13°C. Twenty years ago, H. F. Smith [*Nature* **138,** 329 (1936)] pointed out that the original data do not show the 13° maximum—that an error was made in correcting for control values.

Important concepts are sometimes stated carelessly. In discussing the statistical evaluation of observed deviations from expected genetic ratios, it is said that a ratio of deviation to standard error of less than 1.5 "proves an absolutely normal course of segregation." Incidentally, the ratio of deviation to standard error is called "probable error," a usage unfamiliar to me.

An attempt has been made to bring the book up to date in the translation. This must have been done hurriedly or carelessly, for there are several important omissions. Lederberg's important work on bacterial genetics is barely mentioned. The phenomenon of transformation is briefly considered, but no reference is made to the illuminating findings of Hotchkiss or of Ephrussi-Taylor. Bacterial viruses have perhaps contributed more to genetics in the decade just past than have any other organisms. They go unmentioned. The Watson-Crick structure of deoxyribonucleic acid is not referred to. Some of these omissions, particularly the latter, might be excused on the ground that they were announced too late to be included. However, mention is made of a paper published in 1954 by Weijer, one of the translators, a year after appearance of the Watson and Crick paper on deoxyribonucleic acid structure. Incidentally, a transposition in the bibliography gives Weijer's paper the date 1945.

Because of its inclusion of so much material of historical interest, *General Genetics* may be useful as a reference. It cannot be recommended as a well-organized, clearly written, and accurate account of the principles of genetics as they are understood today.

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Etude Radioanatomique de l'Os Temporal. M. Juster and H. Fischgold. Masson, Paris, 1955. 102 pp. Illus.

Anatomical structure approaches its peak of complexity in the interior of the temporal bone, which is so aptly called "the labyrinth." The authors of *Etude Radioanatomique de l'Os Temporal,* M. Juster and H. Fischgold, have made a unique study of this bone by making roentgenograms of macroscopic serial sections taken in the three planes most frequently employed in radiootology. These dry bone sections, 3 millimeters in thickness, were x-rayed with 2 × enlargements, thus bringing obscure structures, such as the aqueducts, into greater prominence. By viewing the individual sections, one overcomes the initial problem of superimposition and is able to interpret the temporal area in conventional roentgenograms of the skull with greater accuracy. In addition to the serial sections, the authors also present x-ray studies of the isolated bony labyrinth, the ossicles, and facial canal.

Each enlarged x-ray picture is accompanied by a labeled diagram of equal size, which greatly facilitates the interpretation and identification of the numerous anatomical structures. Finally, the authors have provided a brief text description of the radiographic structures of the temporal bone. This book should prove to be a great aid to otologists and others in the study of the ear and temporal area.

Structure is the basis of all function, both normal and pathological, and the authors have provided a means of elucidating the anatomy of a very important but difficult region of the human body. Further study and greater magnification of these radiographic sections may provide a means for earlier detection of otosclerosis and other ear diseases which are accompanied by structural changes in the temporal bone.

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Organic Analysis. vol. III. John Mitchell, Jr., I. M. Kolthoff, E. S. Proskauer, and A. Weissberger, Eds. Interscience, New York, 1956. 546 pp. Illus. $11.50.

Each volume of the Interscience *Organic Analysis* series is a collection of monographs on the determination of important functional groups and on modern techniques that are used in organic analysis. The third volume is more than 70 pages larger than the longest of the previous volumes, yet it contains monographs on only six subjects, as contrasted with nine in each of the earlier volumes. These statistics reflect an improvement in that each subject is now considered broadly, the treatment is more uniformly thorough, and all of the sections include explicit operational directions for selected analytic methods.

Each monograph is prefaced by a simple introduction, addressed to the reader who is not a specialist. The introductions are noteworthy in the way they undertake to orient the reader so that he will be able to make personal use of the information that follows. For example, the fourth monograph begins with a simple and lucid definition of olefinic unsaturation and its chemical characteristics and sets up, specifically, the chemical conditions that the analyst tries to achieve and those that he should avoid in order to obtain unambiguous and precise results.

The subjects treated in the present volume are the determinations of (i) organic acids, (ii) acid anhydrides, (iii) amines and amides, (iv) olefinic unsaturation; (v) analytic mass spectrometry, and (vi) analytic examination of synthetic coating resins. The monograph on the determination of organic acids is

much more extensive than the chapter on microtitration methods in the second volume of the series.

Each monograph has a selected bibliography; the largest, on olefinic unsaturation, contains 698 references. All the authors covered the literature through 1955, and some 1956 publications are also reviewed. There is a general subject index to the three volumes of the series. There were few typographic errors. The only one I found that might cause confusion was the substitution of *nitrate* for *nitrite* in the first paragraph on page 109, and this was corrected in the procedural directions that followed.

The book should prove valuable, not only to analysts, but to all serious students of organic chemistry.

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Psychological Research. Benton J. Underwood. Appleton-Century-Crofts, New York, 1957. 298 pp. Illus. $4.

The title *Psychological Research* will suggest many different things to different readers. If summed, these suggestions would include most of the science of psychology. Any attempt to attack such a subject matter in 292 pages will necessarily involve a large amount of selection and gross summarizing, and it will leave some distinctive marks of the author in the process.

Benton J. Underwood has restricted his coverage to what might be labeled the methodological problems of psychological research. Some indication of the coverage is given by the chapter headings. These, in addition to an "Introduction," are "Analysis of the research situation," "Operational definitions," "Research design I and II," "An overview of explanation in psychology," "Some characteristics of concepts," "The nature of some explanatory attempts," and "Potpourri."

Within the framework outlined by the chapter headings, this book is somewhat author-centered. This characteristic is partially anticipated in the introduction by the statement, "I wish merely to discuss critically some of the problems of research in psychology as I see them." The book is perhaps most tersely described by the word *essay,* for it is a personalized and editorialized account of psychological research. This is shown partly in the style of writing, which has a generous sprinkling of first-person-singular pronouns, autobiographical statements, and brief editorial excursions into such matters as journal publication policy, and so forth. It is also shown by the intermittent insertion of experimental materials that seem to bear little relevance to the outline, while the discussion of some widespread and important problems (stimulus and response definition, scaling, and so forth) falls far short of what is possible at the present stage of psychological development. Since the author's aim is to discuss research topics as he sees them, however, he must be judged as having succeeded. It is probably also true that, in approaching the problem in this way, he has achieved readability and added a human quality to the book.

As the chapter headings suggest, the book addresses itself to many interesting methodological problems—problems that must be attacked by psychologists who have a firsthand familiarity with the concepts, as they work in an experimental program, as well as by philosophers of science who may analyze the formal properties of the concept as these are eventually revealed in articles and secondary sources. As an analysis by an experimental psychologist, the book will broaden the spectrum of material available for the undergraduate and graduate in psychology, while it leaves ample room for a more analytic book, which will present a more specific account of some of the subtleties of these methodological questions and give the psychology student a broader base of information from which he can form his own opinion.

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Osteology of the Reptiles. Alfred S. Romer. University of Chicago Press, Chicago, 1957. 772 pp. Illus. $20.

As initially conceived, this book was to be a revision of S. W. Williston's *Osteology of the Reptiles,* which was published in 1925. In the early stages of the project, however, it became evident that a single revision would not do justice to the many advances in reptilian osteology and classification that have been made in the intervening years. The name and the general plan of organization have been retained, but otherwise the book is completely new. Williston's work was prepared by W. K. Gregory on the basis of a partial draft that was left by Williston, on his death in 1918. It is an excellent, but brief, survey of reptilian osteology and classification. The present volume is detailed and comprehensive.

Alfred Romer's *Osteology of the Reptiles* comprises two major sections. The first presents a structure-by-structure analysis of the reptilian skeleton, and the second, a classification based on skeletal characteristics. The section on structure is introduced by a rather brief account of nonskeletal systems and reptilian embryology. A general discussion of the skeleton follows. The succeeding eight chapters give detailed accounts of the subdivisions of the skeleton, with both living and extinct reptiles as source material. The text is accompanied by 166 figures that portray the structures under consideration. The illustrations are excellent in quality and are based, in large part, on data published over the years in a wide range of zoological and paleontological studies. Text and figures complement each other to provide a coherent and comprehensive survey of reptilian osteology.

The second section is introduced by an account of the history of classification of the reptiles. This is followed by a systematic treatment of the subclasses and subordinate taxonomic categories to the level of family, and, in some cases, subfamily. Descriptions and diagnoses for each categorical rank are presented, and, under the familial listings, there is a comprehensive list of genera, with synonyms. It was, of course, impossible to include a study of even a small part of the nomenclatural problems. Even had this been feasible, it would have seriously detracted from the continuity and general usefulness of the book.

The classification is based on a primary division of the class Reptilia into six subclasses, with one order, Mesosauria, unassigned. The orders that are included under the subclasses are recognized as pertaining either to "Sauropsida" (subclass Anapsida, excluding the cotylosaurs, subclass Lepidosauria, subclass Archosauria, and order Mesosauria) or to "Theropsida" (subclass Ichthyopterygia, subclass Euryapsia, and subclass Synapsida), following Goodrich and, more recently, Watson. The classification is relatively conservative throughout, and well-established names are used for the various groups. Specialists in various fields will undoubtedly find arrangements with which they disagree, for there is no general consensus on the placement of many reptilian genera. The descriptions and diagnoses of the categorical levels, however, are brief and factual and show clearly the reasons for assignments. Illustrations in this section consist of figures of complete skeletons of characteristic genera. Since materials for valid reconstructions are not available for many groups, the pictorial representation is inevitably somewhat irregular.

A short bibliography follows the section on classification. It lists only the major sources of information that were used in compilation of the book. These are presented under headings that relate them to the sections to which they are most pertinent. References to more complete bibliographies are given.

This book is a truly monumental contribution that cannot fail to stand as a